

Precalc Warm Up # 5-1

1. $f(x) = 3x - x^2$ find $f(x + 2) - f(4)$

2. $y = -x^2 + 6x - 2$, $x < 4$. Find range (no graphers).

3. $y = -3x + b$ $x > 0$, $b > 0$ Find range (no graphers).

HW Questions:

PreCalc SL Review Homework

Name _____

Per. _____ Team # _____

1. Solve the system, show work algebraically.

$$\begin{cases} 3x + 5y = -1 \\ -2x + 2y = -10 \end{cases}$$

1. _____

2. Find
- m
- and
- c
- so that the system:
- $\begin{cases} 3x - 4y = -10 \\ 9x + my = c \end{cases}$

has a) no solution

2a) _____

b) infinite solutions

b) _____

3. Solve, show work algebraically.

a) $x + 3 = \frac{28}{x}$

b) $x(x+8) = -7$

3a) _____

b) _____

4. Find k for which $2x^2 + kx + 2 = 0$

has a) one real solution

$$b^2 - 4ac = 0$$

b) 2 real solutions

$$> 0$$

c) no real solution

$$< 0$$

$$b^2 - 4ac$$

$$k^2 - 4(2)(2)$$

$$k^2 - 16$$

4a) _____

b) _____

c) _____

5. Put in turning point form and hence find the vertex.

$$y = 3x^2 + 12x + 17$$

$$y = 3(x^2 + 4x + 4) + 17 - 12$$

$$y = 3(x+2)^2 + 5$$

5. _____

vertex: _____

6. Find the equation of the parabola with x-intercepts at -4 and 3 and y-intercept at -6.

6. _____

7. Solve. Express answer in interval notation.

$$2x^2 + x - 1 < 0$$

7. _____

8. Graph the functions on the same set of axes,
then solve: $f(x) < g(x)$.

$$f(x) = x - 5 \text{ and } g(x) = x^2 - 6x + 5$$

$$x - 5 = x^2 - 6x + 5 \quad (x-5)(x-1) \\ (3-5)(3-1)$$

$$0 = x^2 - 7x + 10 \\ (x-5)(x-2)$$

touches
(intersects)
at one
point

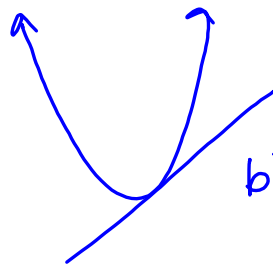
8. solution: _____

9. _____

9. Find m so that the line is tangent to the parabola.

$$y = 2x + m$$

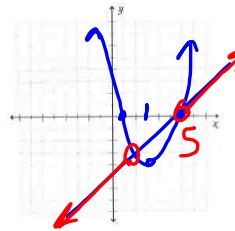
$$y = x^2 + 3x - 5$$



$$2x + m = x^2 + 3x - 5$$

$$0 = x^2 + x - 5 - m$$

$$b^2 - 4ac = 0$$



Translations and Vector Notation:

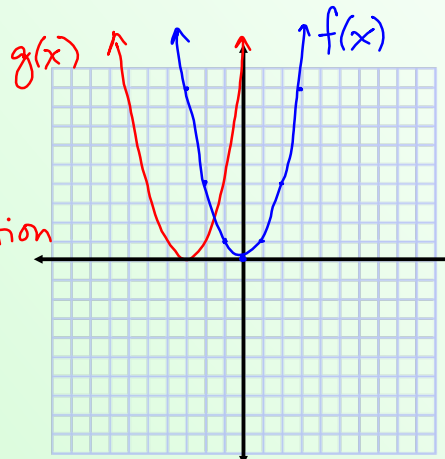
Horizontal translations $g(x) = f(x - a)$

Example: $g(x) = (x+3)^2$

The parent graph $f(x) = x^2$ with a horizontal translation, to the left 3. We have added 3 to all of the x coordinates, giving the appearance that the graph has moved **3 LEFT**.

Vector Notation
for this translation:

$$\begin{pmatrix} -3 \\ 0 \end{pmatrix} \leftarrow \begin{array}{l} x \text{ direction} \\ 3 \text{ left} \end{array}$$

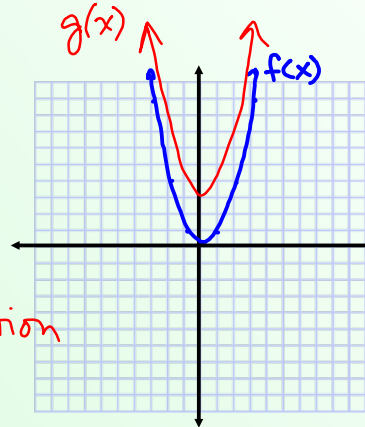


Vertical Translation $g(x) = f(x) + b$

Ex: $g(x) = x^2 + 3$ is the parent graph $f(x) = x^2$, with a vertical translation. We have added 3 to all of the outcomes which makes it look like the graph has been shifted **UP 3**.

Vector Notation
for this translation:

$$\begin{pmatrix} 0 \\ 3 \end{pmatrix} \leftarrow \begin{array}{l} y \text{ direction} \\ \text{up } 3 \end{array}$$



Given the graph of $f(x)$, sketch the graph of $f(x-2)+4$



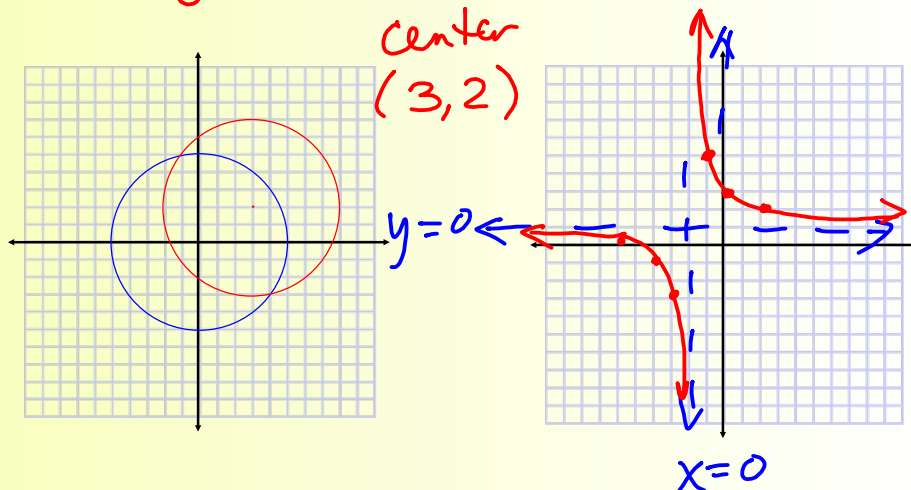
Vector Notation
for this translation:

$$\begin{pmatrix} 2 \\ 4 \end{pmatrix}$$

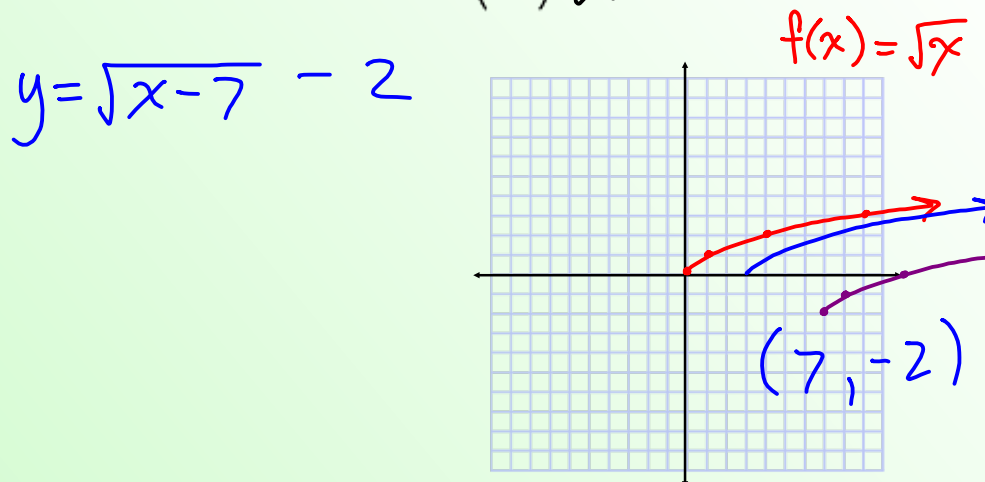
Find an equation of the relation under the translation **vector**, and graph the original equation and the translated one.

1. $x^2 + y^2 = 25$; $\begin{pmatrix} 3 \\ 2 \end{pmatrix}$ $\begin{matrix} \text{Rt} \\ \text{up} \end{matrix}$ 2. $\cancel{xy} = 4$; $\begin{pmatrix} -2 \\ 1 \end{pmatrix}$

$(x-3)^2 + (y-2)^2 = 25$



3. $y = \sqrt{x-3}$; $\begin{pmatrix} 4 \\ -2 \end{pmatrix}$ $\begin{matrix} \text{Rt} \\ \text{down} \end{matrix}$



Express , in terms of $f(x)$, the transformation required to map $f(x)$ to $g(x)$

$$g(x) = a(x-h)^2 + k$$

$$f(x) = x^2, \quad g(x) = x^2 - 6x + 13$$

$$= \underbrace{x^2 - 6x + 9}_{(x-3)^2} + 13 - 9$$

$$= (x-3)^2 + 4$$

$$g(x) = f(x-3) + 4$$

HW: SL Book

p. 174 #1 RC, 2a, 3c, 4c, 5c,

6 LC, 7 LC, 9ab

Quiz Thursday

PC: 2.1, 2.2, 2.4, 2.5

SL: 5.1, 5.2, 6.1, 6.2, 6.3